Lastly, we must protest against the treatment given to Reis's Telephone, of which the book declares that it "has always remained a purely musical apparatus." It is perfectly clear that neither M. Hospitalier nor Dr. Maier can have read Reis's own papers when they make this assertion, which those papers amply refute, and which a careful trial of Reis's own instruments will also amply contradict. Reis invented his instrument, taking the human ear as pattern, *because* the human ear can vibrate to all kind of sounds. He invented it, meaning it to transmit speech, and though it transmitted music better than speech—and both imperfectly—it did, to a certain degree, fulfil its inventor's aim. The author seems in fact to have viewed Reis's invention through the hazy medium of the writings of Count du Moncel, or some less reliable authority; for he mentions Yeates's experiments of 1865 (in which articulate speech was transmitted by a modified Reis instrument with such accuracy that the voices of individual speakers were recognised), and then adds: "The musical telephone might have become an articulating telephone under these conditions, *but this result was not obtained*, partly on account of the imperfection of the instrument, and *partly because Yeates had no such result in view!*" How this extraordinary distortion of well-known facts has crept into the book before us we are at a loss to conjecture. Doubtless the numerous excellent illustrations with which the book is adorned will procure for it a ready sale.

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## HANDBOOK FOR NORTHERN AND CENTRAL JAPAN

*A Handbook for Travellers in Central and Northern Japan, &c., with Maps and Plans.* By Ernest Mason Satow, Second Secretary and Japanese Secretary to H.B.M. Legation, and Lieut. A. G. S. Hawes, Royal Marines (Retired). (Yokohama: Kelly and Co.; Shanghai: Kelly and Walsh, 1881.)

As a mere handbook this work is indispensable to the European traveller in Japan. But it is much more than a handbook, it not only indicates what is sightworthy, but explains by illustrative myth or legend, drawn from local tradition or from the little explored treasures of Japanese literature, the special interest with which mountains, temples, mounds, groves, and places are invested in the eyes of such Japanese as have not yet abandoned their nationality. To readers of this journal the most valuable portion of the book will be the description as accurate as minute of the Alpine region formed by the provinces of Etchiu and Hida (now the prefectures of Ishikawa and Gifu)—a region difficult of access even to natives, and almost untrodden by Europeans. The mountain range bounding this wild and remote tract on the East is the most considerable in Japan, extending nearly due north and south for some sixty or seventy miles, and rugged with innumerable peaks, the most conspicuous of which, beginning from the north, are Tatéyama, 9500 feet, Goroku-daké, 9100 feet, Yari-ga-také, 10,000 feet, and Norikura, 9800 feet. The chain is not of homogeneous structure, nor are the peaks of contemporaneous origin. The basis is a closegrained granite, not unfrequently rich in garnets. Through this backbone or axis vast masses of igneous and volcanic rock have been extruded, the volcanic rock principally trachytic, often coarse-grained, and occasionally (Tate-yama) columnar. Of the peaks, Yari-ga-také (spear-peak) seems the most ancient, and consists of an intensely hard, foliated rock with curiously contorted siliceous bands and of an almost equally hard porphyry breccia. Nori-kura (ride-saddle) and Tatéyama (steep-hill) are both volcanic. Goroku-daké or Renge (Lotus flower Peak) consists of a mass of trachytic porphyry piled upon and against a close-grained granitic rock. The lower slopes of the range are overlaid, say our authors, by sedimentary rocks, but I am inclined to doubt the accuracy of this statement. Under the fierce sun and incessant rain of summer aërial denudation proceeds at a great rate, especially in the granitic districts of Japan, as may be well seen in the neighbourhood of Kobé, and the existence of a quasi-sedimentary rock may thus be easily accounted for. But true sedimentary rocks, excluding lacustrine deposits or fluvial alluvia, require the agency of the sea, and the greater part of the covering strata of the Japanese islands, is of very recent origin, and has never been under the sea. Only for a few days in early autumn does snow disappear from these peaks, the curiously abrupt and jagged outlines of which recall and even justify the mountain-forms common in Chinese pictures. The fauna of the district is little known. Ptarmigans are common, so also are flying squirrels, as well as bears, two species, of wild boar, and the curious goat-faced antelope. The flora has been more studied. Dense forests clothe the slopes, principally of beech and of several species of oak, mostly evergreen. Conifers are less abundant than is common in Japan. But the pretty 5-leaved *Pinus parviflora*, S. and Z., as well as, though to a less extent, *Cryptomeria japonica*, *Chamæcyparis obtusa*, S. and Z., and *C. pisifera*, S. and Z., are not infrequent. I am not sure, for reasons too long to state here, that the Cryptomeria, despite its frequency, is indigenous to Japan. Two or three kinds of Betula show themselves at elevations of 4000-5000 feet. Below this level many examples of the genera Epilobium, Scabiosa, Hypericum, Parnassia, Euphrasia, Lilium (*L. auratum* and *L. tigrinum*), Hydrangea, Smilax, Akebia, Tylophora, &c., constitute a vegetation by no means without a western European aspect. Above 5000 feet Vaccinium, Diphylleia, Trollius, Paris, *Fragaria vesca*, and Anemone make their appearance. The common Pinguicula is also found, and probably *Loiseleuria procumbens*, which I have gathered on the slopes of Asama-yama, finds a home on those of the Hida mountains. Above 8000 feet a small Dicentra (*D. pusilla*, S. and Z.?), a yellow violet, *Shortia uniflora*, and *Schizocodon soldanelloides* are to be seen interspersed among bushes of a dwarf azalea. But it is doubtful whether any true Alpine flora exists in Japan.

On Taté-yama the climber passes by some hexagonally columnar examples of andesite, said to have been originally prostrate trunks of trees over which a woman incautiously stepped, which so offended the deities that they were changed into useless blocks of stone. The spot is called Zai-moku-zaka or timber-steep to this day, in commemoration of the fact. Solfataras, it should be mentioned, are as common in this district as in other parts of Japan. A curious means of crossing deep ravines and precipitously walled valleys, known as Kago-

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no-watashi—basket-crossing—is much used in these provinces. A sort of wicker cradle is suspended on hempen ropes slung across the valley, and is drawn by lines to one side or the other, or, as is more usually the case, the peasant crosses without assistance. Entering the cradle, he seizes the ropes above with his hands, and by a series of dexterous jerks, needing considerable practice for their due accomplishment, takes himself and the cage across. The great danger seems to be that of getting the cradle from under him, and thus leaving his body suspended in mid-air. His struggles are represented no less quaintly than vigorously in a drawing by Hokusai, to be found in the 13th volume of his Manguwa, or Rough Sketches.

A distinguishing feature of the book is the elaborate account given of the principal mountains, most of which have been ascended by the authors. Fuji, of course, is the highest, Dr. Rein making it 12,280 feet, Mr. Stewart 12,365 feet. The curiously jagged outline of the comparatively narrow rim of the crater shows doubtless that the broad deep cavity, of which the diameter is about 1500 feet, and the depth about 550 feet, was usually full of boiling lava, spurted up from time to time in the manner described by Miss Bird in her graphic description of the great volcanic districts of Kilauea and Mauna Loa. It is not mentioned that the two wells on the summit, on the edge almost of the crater itself, the Famous Golden Water and the Famous Silver Water, derive their supply from hoards of snow preserved by overlying masses of wind-heaped scoriæ, and volcanic dust from perishing under the fiery rays of the summer sun. One of the most interesting of the many peaks which Messrs. Satow and Hawes are the only Europeans who have ascended, is Mount Ganjiu, of which the shapely outlines rise in beautiful logarithmic curves high over the plains of Nambu. The mountain consists of three volcanic cone-frusta "telescoped" into each other. The lower cone is of course the oldest, the rim of its crater being still distinct at a height of about 5000 feet. A smaller cone about 600 feet high, rises within this, the rim of the crater of which is nearly equally distinct, and a third and smallest cone tops all, having a height of not more than 100 feet, and showing a crater at its summit, from which jets of steam still issue.

It is noteworthy that in Japan the names of rivers, capes, plains, and villages are usually pure Japanese, those of mountains more commonly Chinese. Some of the place names in the northern part of the main island have a distinctly Aino character, for instance, such a name as Namakunai, and many of the names ending in "bé," a corruption of "betsu," the Aino word for river.

Two capital maps accompany the book, which the stay-at-home reader will find as full of curious lore as the traveller of valuable information.

FREDK. V. DICKINS

## OUR BOOK SHELF

*Studies in Nidderdale*. By Joseph Lucas, F.G.S., F.M.S., Telford Medallist of the Institution of Civil Engineers, Associate of the Institute of Surveyors. (London: Elliot Stock. Pateley Bridge: Thomas Thorpe.)

THIS book is the result of notes and observations other than geological, made in Nidderdale during the progress of the Government Geological Survey of that district, between the years 1867 and 1872.

Nidderdale is a remote pastoral valley, formed by the River Nidd, which takes its rise near the mountains of Great and Little Whernside, and which, after a course of about thirty-five miles, joins the Ouse near York.

The basin of the Nidd, above Hampsthwaite, includes an area of eighty square miles, and for sixteen miles from Great Whernside, the valley proper is nowhere more than one mile wide from ridge to ridge, and is from 500 to 800 feet deep, forming as it were a deep groove in the vast easterly sloping heather-covered moorland.

After a few introductory remarks upon the geology and geography of Nidderdale, Mr. Lucas deals with the cattle, sheep, and other matters connected with the farm, including instructive and exhaustive discussions upon the various names. In the dairy department we have the *kern* (old Norse, kirna—a churn), now a revolving barrel or tub, on a horizontal axis, the *sile* (old Norse, sahl—a sieve), and *sine*, Saxon *sihan*—to strain; and the "lile roond thithel" for stirring cream. The old cheese press is described in detail, and there is an excellent drawing of a very old form of that dairy implement, very like such as we remember to have seen long ago in remote rural districts in the north. Then there is a very interesting chapter upon the farm itself, in which Mr. Lucas introduces a farmer speaking in the dialect, and describing by their appropriate names and uses, the various buildings, fields, and animals to be found upon his farm; interspersed with these the author has put the various Norse, Anglo-Saxon, or Celtic words, from which many words in the folk speech have been derived, so that we have a means of tracing the sources of the dialect while we are becoming acquainted with its local use.

Mr. Lucas must have had opportunities such as very few others could have had, to trace out the natural science of the district, and as the passage will give a good idea of concise and clear style in which the book is written, we give an extract from the chapter on "Vestiges of the Ancient Forest."

"Nidderdale and its moors have formerly been covered by an extensive forest. Many trees lie buried in the peat upon the moors. In the thousands of sections made by little water-courses, the birch appears almost everywhere predominant. Hazel 'sealh' (willows), thorn, oaks, &c., also occur, but the birch must have formed a thick and almost universal forest by itself, such as may be seen on the west coast of Norway at the present day. The upper parts of the moorland gills, and much of what is now the moors, must formerly have made a beautiful appearance with its light gauze-like forest of birch and mountain-ash. The last surviving example on any considerable scale is present in Birk Gill, a tributary of the River Burn. The run of the Gill is north-west to south-east. The Gill is about 400 feet deep at its mouth, and half a mile wide from ridge to ridge. Like all other valleys of the same elevation in these hills, it is boat-shaped in section, the beck running in a deep ravine at the bottom. The sides of the hills are wild heathery moorland, crowned with fine lines of crags down to the edge of this ravine in which the native forest is preserved. There is no cultivation in the Gill, the bottom of which is about 600 feet above the sea at its mouth. The belt of wood clothes the sides for 200 feet, or up to 800 feet near its mouth, and ends where the stream reaches 900 feet in a distance of rather more than a mile. Above this the stream is called Barnley Beck. The wood consists of mountain ash, alder, oak, ash, birch, holly, and thorn, running above the edge of the cleft with a delightfully irregular and feathery margin on the ling covered moor." Subjoined to this is an elaborate table giving the aspect, height, and soil of the various trees found in this valley. A chapter is devoted to the modern botany of the valley, upon which there are also valuable notes in the introduction by Mr. J. G.

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